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Versatile Chemical Solution Dispenser

David L. Strock

Indiana University - Purdue University Fort Wayne

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A V E R S A T I L E C H E M I C A L
S O L U T I O N D I S P E N S E R

A senior design project
report prepared for:

Dr. Warren W. Worthley
Chairman,
Department of Manufacturing Technology
Indiana University-Purdue University at Fort Wayne
Fort Wayne, Indiana

by:

David L. Strock

as part of the curriculum
of the Bachelor's program
in Manufacturing Technology

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A B S T R A C T

A basic procedure in laboratory testing operations is the dispensing of reagent solutions in accurately measured quantities. Due to the high cost of sophisticated dispensing equipment a majority of laboratories, because of budget constraints, still use inefficient manual methods of dispensing. The Versatile Chemical Solution Dispenser has been designed as an inexpensive and very versatile dispenser offering several convenience and safety features plus nearly universal chemical compatibility. A full-scale prototype unit has been built and subjected to functional testing. The prototype unit demonstrates the easy selection of output from 5 to 100 milliliters, operation of the by-pass valve, and safety features, but has not achieved the $\pm 1.5\%$ accuracy goal due to internal leakage problems. Initial manufacturing cost estimates based on the prototype design greatly exceed the \$12 per unit goal but can be significantly reduced by design refinement.

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